In the Claims

Claims are amended as follows:

1. (currently amended) A method of channel equalisation comprising:

receiving a data stream generated from a plurality of space time coded (STC) data streams received from a plurality of transmit antenna elements;

generating via a fast transform a packet spectrum of at least a portion of the data stream, the packet spectrum being a transform domain representation;

receiving a training sequence for a channel through which the data stream has been sent and assessing a channel impulse response for the channel based on the training sequence;

generating via a fast transform a channel impulse response spectrum in the transform domain for the channel impulse response;

equalising the packet spectrum with the channel impulse response spectrum to produce an equalised packet spectrum in the transform domain; and

converting the equalised packet spectrum into time domain equalised data for recovery of information.

2. (original) The method of claim 1, wherein equalising the packet spectrum further includes:

deconvolving transmitted and received data streams with respect to channel impulse response spectra, thereby to produce at least one equalised data stream.

3. (original) The method of claim 1, wherein equalising the packet spectrum includes performing a minimum mean square error (MMSE) spectral ratio comparison.

4. (original) The method of claim 1, further comprising truncating the channel impulse response spectra to limit processing and enhance accuracy associated with equalising the packet spectrum.

5. (cancelled)

6. (original) The method of claim 1, wherein assessing the channel impulse response for the channel based on the training sequence further includes assessing a matrix-valued channel impulse response.

7. (original) The method of claim 1, further comprising receiving the data stream at a plurality of receive antenna elements.

8. (original) The method of claim 1, wherein the fast transform is a Fourier transform.

9. (original) The method of claim 1, wherein the data stream is distributed in slots across a plurality of frames, each slot including the training sequence.

10. (currently amended) The method of claim 1, wherein the data stream is arranged such that a code-word level construction of ~~an STTD transmitted~~ a Space Time Transmit Diversity (STTD) signal is modified to a chip-level construction in which Code Division Multiple Access (CDMA) code words are interleaved at a chip level instead of being transmitted whole in sequence.

11. (original) The method of claim 1, wherein the data stream is a slot of a data frame and the method further comprising reading the slot into memory.

12. (original) The method of claim 11, wherein said at least a portion of the data stream includes a packet overlap.

13. (currently amended) A computer program product for a processor of a channel equaliser, the computer program product comprising:

code that supports reception of a data stream generated from a plurality of space time coded (STC) data streams received from a plurality of transmit antenna elements;

code that generates via a fast transform a packet spectrum of at least a portion of the data stream, the packet spectrum being a transform domain representation;

code that supports reception of a training sequence for a channel through which the data stream has been sent and code that assesses a channel impulse response for the channel based on the training sequence;

code that generates via a fast transform a channel impulse response spectrum in the transform domain for the channel impulse response;

code that equalizes the packet spectrum with the channel impulse response spectrum to produce an equalised packet spectrum in the transform domain; and

code that converts the equalized packet spectrum into time domain equalized data for recovery of information;

wherein the codes reside in a computer readable medium.

14. (original) The computer program product of claim 13, further comprising:

code that deconvolves transmitted and received data streams with respect to channel impulse response spectra, thereby to produce at least one equalised data stream, the code that deconvolves associated with the code that equalizes the packet spectrum.

15. (original) The computer program product of claim 13, further comprising:

code that assesses a matrix-valued channel impulse response, said code associated with the code that assesses the channel impulse response for the channel based on the training sequence.

16. (currently amended) The computer program product of claim 13, further comprising:

code that modifies a code-word level construction of ~~an STTD transmitted~~ a Space Time Transmit Diversity (STTD) signal is modified to a chip-level construction in which Code Division Multiple Access (CDMA) code words are interleaved at a chip level instead of being transmitted whole in sequence.

17. (currently amended) An integrated chip having a controller programmed to provide a channel equalisation function, the controller comprising:

a first receiver chain arranged, in use, to receive a data stream generated from a plurality of space time coded (STC) data streams received from a plurality of transmit antenna elements;

a first fast transform function arranged to generate a packet spectrum of at least a portion of the data stream, the packet spectrum being a transform domain representation;

a second receiver chain arranged, in use, to receive a training sequence for a channel through which the data stream has been sent;

a channel impulse response estimator for assessing a channel impulse response for the channel based on the training sequence;

a second fast transform function arranged to generate a channel impulse response spectrum in the transform domain for the channel impulse response;

an equalizer arranged to equalise the packet spectrum with the channel impulse response spectrum to produce an equalised packet spectrum in the transform domain; and

an inverse transform function arranged to converte the equalised packet spectrum into time domain equalised data for recovery of information.

18. (original) The integrated circuit of claim 17, wherein the equalizer further includes:

a deconvolving function arranged to deconvolve transmitted and received data streams with respect to channel impulse response spectra, thereby to produce at least one equalised data stream.

19. (currently amended) An equaliser comprising:

a first input for receiving a data stream generated from a plurality of space time coded (STC) data streams received from a plurality of transmit antenna elements;

a processor arranged to select a sub-slot of data from the data stream and to implement a fast transform on the sub-slot to generate a packet spectrum for the sub-slot of data, the packet spectrum being a transform domain representation;

means for storing a channel impulse response spectrum generated from a fast transform of a channel impulse response of a channel through which the data stream has been sent, the channel impulse response spectrum being in the transform domain;

a least squares spectral ratio comparator coupled to receive the packet spectrum and the channel impulse response spectrum, the least spectral ratio comparator having an output providing an equalised packet spectrum in the transform domain; and

means for converting the equalised packet spectrum into time domain equalised data for recovery of information.

20. (original) The equaliser of claim 19, further includes:

means for deconvolving transmitted and received data streams with respect to channel impulse response spectra, thereby to produce at least one equalised data stream.

21. (original) The equaliser of claim 19, further comprising means for truncating the channel impulse response spectra to limit processing and enhance accuracy associated with equalising the packet spectrum.

22. (cancelled)

23. (original) The equaliser of claim 19, further comprising a memory storing a matrix-valued channel impulse response.

24. (original) The equaliser of claim 19, the equaliser coupled to receive the data stream through a plurality of receive antenna elements.

25. (original) The equaliser of claim 19, wherein the first and second fast transforms are Fourier transforms.

26. (original) The equaliser of claim 19, wherein the data stream includes the training sequence.

27. (original) The equaliser of claim 19, wherein the data stream is selected from a group comprising: STTD signals; transmit diversity signals; and STC signals.

28. (currently amended) A radio communication device comprising the equaliser having:

a first input for receiving a data stream generated from a plurality of space time coded (STC) data streams received from a plurality of transmit antenna elements;

a processor arranged to select a sub-slot of data from the data stream and to implement a fast transform on the sub-slot to generate a packet spectrum for the sub-slot of data, the packet spectrum being a transform domain representation;

means for storing a channel impulse response spectrum generated from a fast transform of a channel impulse response of a channel through which the data stream has been sent, the channel impulse response spectrum being in the transform domain;

a least squares spectral ratio comparator coupled to receive the packet spectrum and the channel impulse response spectrum, the least spectral ratio

comparator having an output providing an equalised packet spectrum in the transform domain; and

means for converting the equalised packet spectrum into time domain equalised data for recovery of information.

29. (currently amended) An equaliser comprising an input, a ~~RAM memory~~ a Random Access Memory (RAM) block, a RAM sample block, a spectrum ratio calculator having a first input connected to the RAM sample block and a second input connected to a RAM having an impulse response spectrum;

wherein the equaliser is operable to:

receive a data stream ~~of digital signals~~ generated from a plurality of space time coded (STC) data streams received from a plurality of transmit antenna elements;

fill a RAM memory block; converting the ~~signals~~ data stream by way of a fast Fourier transform operation to provide a sample RAM block Y_k (packet spectrum) and providing the ~~signals~~ data stream to a first input of an equaliser; and

receive, at a second input of the equaliser, an impulse response spectrum held within the RAM, which impulse response spectrum is a fast Fourier transform of the channel impulse response;

thereby to equalise the ~~signals~~ data stream whereby to provide an equalised packet spectrum which undergoes an inverse fast Fourier transform to provide equalised packet waveforms.